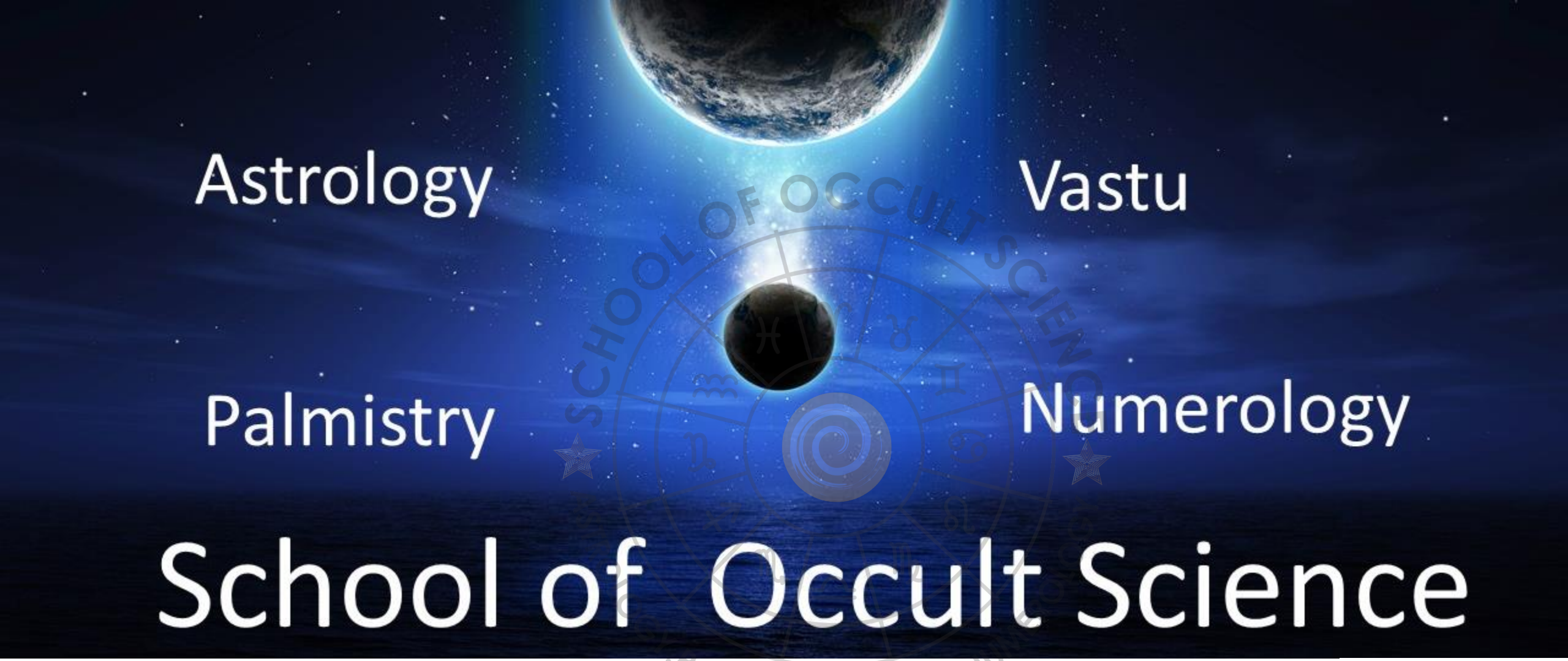


Astro Scholar - Astronomy

School of Occult Science

Some Astronomical terms

- **Celestial Sphere.** In astronomy and navigation, the **celestial sphere** is an abstract **sphere** that has an arbitrarily large radius and is concentric to Earth. All objects in the sky can be conceived as being projected upon the inner surface of the **celestial sphere**, which may be centered on Earth or the observer. Hence if the imaginary expansion of Georgraphy is made infinitely in the cosmos then the spherical empty spaces around the earth is called celestical sphere with centre at the earth's centre.
- **Celestial Equator** : Infinite expansion of equator in the cosmos is Celestial Equator.
- **Geo-Centric.** Geo-Centric literally means "the Earth in the Center" and this is the approach that is used by most astrologers, and also by astronomers when measuring and observing the stars and planets. On a practical level, it simply means that the sky is being observed from the Earth, and that measurements are based on spherical geometry and the use of the **Celestial Sphere.**
- **Great Circle.** A Great Circle is any circle that divides a sphere (or in particular the **Celestial Sphere)** into two equal halves. The equator is a Great Circle, dividing the sphere of the Earth into two halves. All lines of Longitude are also Great Circles (connecting the North and South poles). Lines of Latitude (except for the equator), however, are not Great Circles.
- **Fixed Stars.** When the ancients observed the night sky, they noticed that some of the stars seemed to move or wander from night to night. These, of course, were the planets. The way that they were able to determine that the planets moved, however, was because they noticed that the rest of the stars in the sky stayed in the same positions night after night. These are the **fixed stars**, and they are used as reference points in order to measure the relative positions and movement of the planets.

Some Astronomical terms (cont)

- **Constellations.** Constellations are groups of **fixed stars** that have become associated with a figure. Different constellations are visible at different times from different locations on the Earth. There are literally hundreds of constellations. Among these are the **constellations** of Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius, and Pisces.

- **Ecliptic.** The Ecliptic is the **Great Circle** that describes the apparent path of the Sun around the Earth (but which is really the orbit of the Earth around the Sun. The Ecliptic extends approximately 8-9° of arc above and below (North and South of) the actual path of the Earth/Sun. The other planets in the solar system are always visible within this band of sky. The longitudinal (East-West) position of celestial bodies (i.e. planets, asteroids, etc.) is measured along the ecliptic.

- **Signs.** The Signs are units of measurement each equal to 30 degrees of arc along the **ecliptic.**

- **Zodiac.** The Zodiac refers to the different names for the **Signs** dividing the **ecliptic**. The **Signs of the Zodiac** are named after twelve of the **Constellations** that intersect the **ecliptic.**

- **Vernal Point.** The point measured along the **ecliptic** that represents the apparent position of the Sun at the moment of the Vernal (Spring) Equinox.

- **Vernal equinox**, two moments in the year when the Sun is exactly above the Equator and **day and night are of equal length**; In the Northern Hemisphere the vernal equinox falls about March 20 or 21, as the Sun crosses the celestial equator going north. In the Southern Hemisphere the equinox occurs on September 22 or 23, when the Sun moves south across the celestial equator.

Western Astrology v/s Vedic Astrology

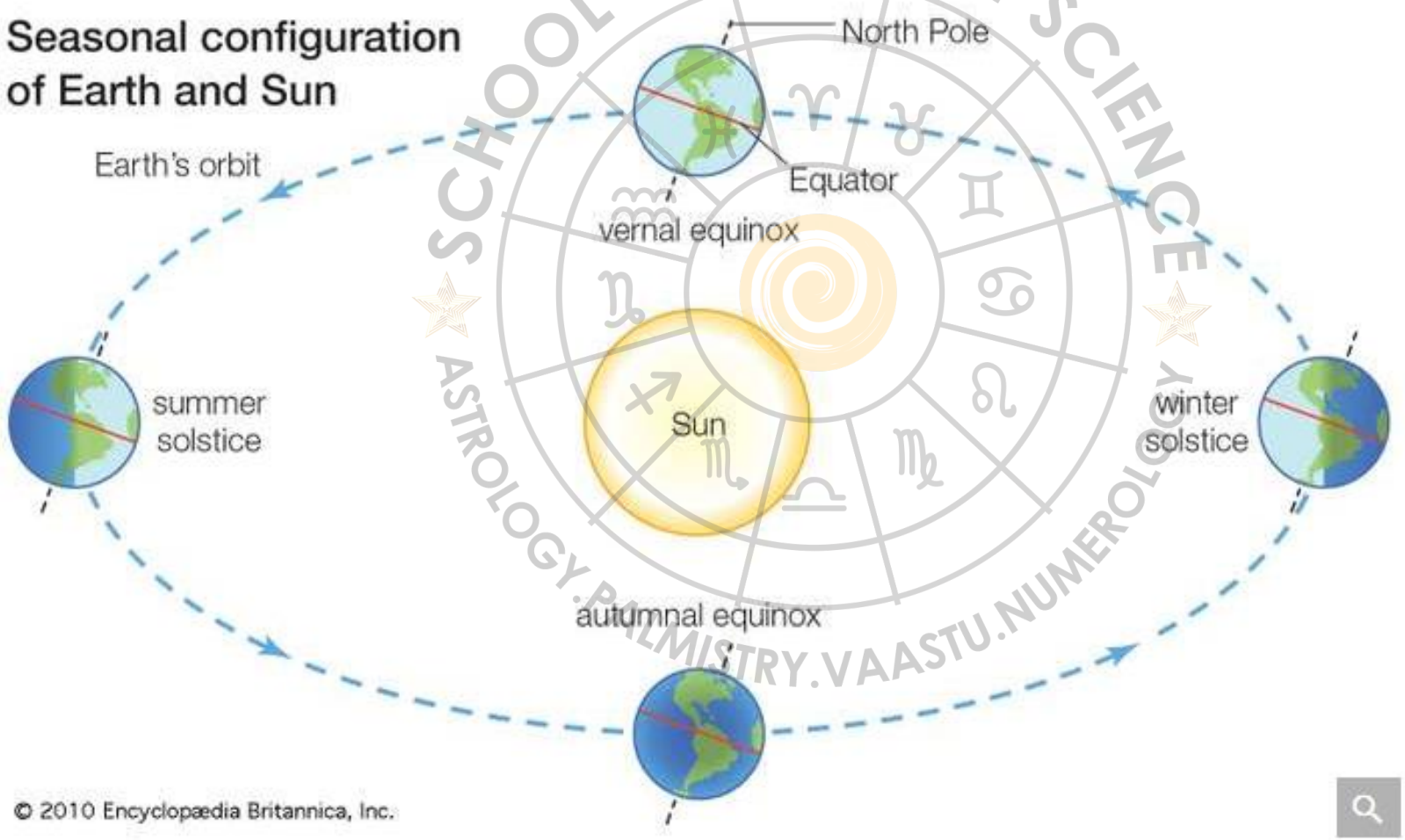
- According to Western theory, day is calculated on the basis of its revolution on its axis while according to Indian theory, day is calculated from one Sun rise to next Sun rise. Calculation of month is based on the revolution of moon around the Earth and according to the phases of moon.

- The time period between one new moon to next new moon is called one lunar month. 30 days are called one savan month. The time period for travelling by Sun between one point in Ashwani to same point again in Ashwani is called one Solar year.

- In Western Theory Standard Time is taken into account while in Indian theory Local Mean Time is used.

- According to Western theory, at the time of Vernal Equinox, the position of Sun is considered as the first point of Aries. Now this point is displaced about 50'' to 52'' every year. That's why it is called movable point. According to Indian theory, Astronomical calculations are done with respect to the fixed point which is the beginning point of Aries sign (Ashwani Nakshatra). The angular distance between the fixed and movable points of Aries Sign is called Ayanamsa which was 23°52' on 1.1.2001. As on 2010 it is taken as 24° .

Equinox and Solstice



Wobbling of Earth

- The Earth doesn't so much shift on its axis as it wobbles. The Earth's axis is tilted at an angle of approximately 23.5° to the plane of the ecliptic. This tilt is what produces the seasonal variations. The Earth is also not a perfect sphere; it bulges in the middle near the Equator. This unequal distribution of mass causes the Earth to wobble around its rotational axis. What this means is that the Earth's axis makes its own rotation, with the North and South Poles slowly describing a circle around the **ecliptic pole** (which is the pole exactly perpendicular to the plane of the ecliptic; the North and South poles, remember are tilted 23.5 degrees away from this plane). How slowly? Well, a complete cycle takes about 25,800 years.

- This rotation of the Earth's axis occurs at something like 1° every 71.5 years (about 5 seconds of arc per year).

Ayanamsa

- **Ayanamsa** is the Sanskrit term. Precision of equinoxes is the most popular translation to this word. It is **defined** as the difference (in angles) between sidereal and tropical ecliptic longitude. ... The angular distance between vedic first point and the vernal equinox is the **Ayanamsa**.
- Most Common Ayanamsa currently in use is **Lahiri's ayanamsa** which is 24º8'27'' as on 8th May 2020. It considers displacement of 50.290966".

The Tropical Zodiac (Sayana Chakra) and the Sidereal Zodiac (Niryana Chakra)

- Both divide the zodiac into twelve "signs" that are divided into 30° each (making a total of 360°) and named after constellations, but…..
- the sidereal system defines the signs relative to the apparent gradual motion of fixed stars at about 1° westward every 71.5 years from Earth's perspective,
- the tropical zodiac fixes the Northern Hemisphere's vernal equinox point (the Sun's position at the March equinox) to 0° of Aries, without taking the precession of the equinoxes into account, and defines the rest of the zodiac from this point
- Because of the sidereal zodiac using a correction called **ayanamsa** to account for the precession of equinoxes, the two systems do not remain fixed relative to each other and drift apart by about 1° per 71.5 years. The current difference stands at about 24° and 8 minutes 27'' as on 8th May 2020.
- The tropical system remains prevalent in Western astrology.

Comparison of Equinox over Centuries

Precession of the equinoxes, the changing position of the vernal equinox over the course of about 25,800 years. The yellow line is a section of the ecliptic, the apparent path the Sun appears to follow over the course of an Earth year. The purple line is the celestial equator, the projection of Earth's equator onto the celestial sphere. The point (red) where these two lines cross is the vernal equinox. In 1500 BCE, it was near the end of Aries; in 500 BCE, it was near the beginning of Aries; and in 1000 to 2500 CE Pisces.